

# MINING AND QUARRYING TRENDS

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**Domestic survey data were prepared by the author and each of the statistical assistants who has responsibility for the mineral commodities indicated.**

The mining and quarrying trends shown in this report were calculated from nonfuel mineral data reported to the U.S. Geological Survey (USGS) by mining and quarrying companies operating in the United States. The data for 2004 were reported on the “Mine, Development, and Mineral Exploration Supplement” statistical survey conducted by the USGS and on the production surveys for some more widely produced nonfuel mineral commodities, such as sand and gravel. Additional data for 2004 were derived from annual USGS production and consumption surveys of nonfuel mineral producers; these surveys covered 58 nonfuel mineral commodities produced in the United States. Nonfuel minerals exclude coal, petroleum coke, and related products.

As shown in this report, mining and quarrying data for 2004 include the annual data for construction sand and gravel and crushed and dimension stone. From 1981 to 1993, these mineral commodities were surveyed biennially and appeared alternately in this report. The inclusion of both sets of data in this report results in essentially a complete coverage of nonfuel mineral production in the United States. Comparisons of the 1994 to 2004 data with previously reported annual data, however, are not possible.

The data in the following tables are reported according to the primary product of a mine or operation. The primary product is usually determined by the product with the highest total value for the year. In some instances, the values of two products at the same operation are so similar that the products are coproducts. To account for the data without double counting, however, a product of lesser value is considered to be a byproduct.

Total domestic mining of nonfuel mineral materials amounted to 5.8 billion metric tons (Gt) in 2004, a 5% increase compared with that of 2003. These materials included 4.3 Gt of crude ore mined or quarried and 1.5 Gt of mine ore and waste from development operations. Of the nonfuel mineral materials mined, 61% was for the production of industrial minerals, and 39% was for the production of metals. Overall, 98% of nonfuel minerals was mined and quarried at surface level, and 2% was mined underground.

Total surface mining and quarrying for industrial minerals amounted to 3.5 Gt, a 4% increase compared with that of 2003. Crude ore mined at these surface operations was 3.0 Gt, and 409 million metric tons (Mt) was ore and waste from development operations. Underground mining for industrial minerals amounted to only 108 Mt, nearly all of which was crude ore.

Total surface mining for metal ores amounted to 2.2 Gt, a 7% increase compared with that of 2003. Of the more than 2.2 Gt, nearly 1.2 Gt was crude ore mined, and slightly less than 1.1 Gt was ore and waste from development operations. Underground mining of metal ores amounted to only 16 Mt, of which 88% was crude ore.

The major States in which mining for nonfuel minerals took place, in order of total material handled, were Nevada, Arizona, Florida, California, Minnesota, Texas, Michigan, Utah, Pennsylvania, and Ohio. These 10 States accounted for about 63% of the tonnage of nonfuel minerals mined in the United States. Virtually all nonfuel mine production in these States was from surface operations.

TABLE 1  
MATERIAL HANDLED AT SURFACE AND UNDERGROUND MINES IN THE UNITED STATES, BY TYPE<sup>1</sup>

(Million metric tons)

| Type of ore and year            | Surface <sup>2</sup> |                    |                    | Underground <sup>3</sup> |                    |                  | All mines          |                    |                    |
|---------------------------------|----------------------|--------------------|--------------------|--------------------------|--------------------|------------------|--------------------|--------------------|--------------------|
|                                 | Crude ore            | Waste <sup>4</sup> | Total              | Crude ore                | Waste <sup>4</sup> | Total            | Crude ore          | Waste <sup>4</sup> | Total              |
| <b>Metals:</b>                  |                      |                    |                    |                          |                    |                  |                    |                    |                    |
| 2000                            | 1,120                | 1,020              | 2,140 <sup>r</sup> | 32                       | 1                  | 33               | 1,150              | 1,020              | 2,170              |
| 2001                            | 1,080                | 1,120              | 2,200 <sup>r</sup> | 17                       | 3                  | 20               | 1,100 <sup>r</sup> | 1,120              | 2,220 <sup>r</sup> |
| 2002                            | 1,060 <sup>r</sup>   | 1,020              | 2,080 <sup>r</sup> | 15                       | 3                  | 18               | 1,070              | 1,020              | 2,090              |
| 2003                            | 1,050 <sup>r</sup>   | 1,020 <sup>r</sup> | 2,070              | 14                       | 1 <sup>r</sup>     | 15 <sup>r</sup>  | 1,070              | 1,020 <sup>r</sup> | 2,090 <sup>r</sup> |
| 2004                            | 1,160                | 1,060              | 2,220              | 14                       | 2                  | 16               | 1,180              | 1,060              | 2,240              |
| <b>Industrial minerals:</b>     |                      |                    |                    |                          |                    |                  |                    |                    |                    |
| 2000                            | 2,780                | 381                | 3,160              | 110                      | (5)                | 110              | 2,890              | 381                | 3,270              |
| 2001                            | 2,840                | 358                | 3,200              | 114                      | (5)                | 114              | 2,960              | 358                | 3,310              |
| 2002                            | 2,850                | 442                | 3,290              | 108                      | (5)                | 108              | 2,960              | 442                | 3,400              |
| 2003                            | 2,900                | 416                | 3,310              | 107                      | (5)                | 107              | 3,000              | 416                | 3,420              |
| 2004                            | 3,040                | 409                | 3,450              | 108                      | (5)                | 108              | 3,150              | 409                | 3,560              |
| <b>All mineral commodities:</b> |                      |                    |                    |                          |                    |                  |                    |                    |                    |
| 2000                            | 3,900                | 1,400              | 5,300              | 142                      | 2 <sup>r</sup>     | 144 <sup>r</sup> | 4,040              | 1,400              | 5,450 <sup>r</sup> |
| 2001                            | 3,920                | 1,480              | 5,400 <sup>r</sup> | 131                      | 4 <sup>r</sup>     | 135 <sup>r</sup> | 4,050              | 1,480              | 5,530              |
| 2002                            | 3,910 <sup>r</sup>   | 1,460              | 5,370 <sup>r</sup> | 123                      | 3 <sup>r</sup>     | 126 <sup>r</sup> | 4,030 <sup>r</sup> | 1,460 <sup>r</sup> | 5,490 <sup>r</sup> |
| 2003                            | 3,950 <sup>r</sup>   | 1,430 <sup>r</sup> | 5,380              | 121                      | 2 <sup>r</sup>     | 123 <sup>r</sup> | 4,070 <sup>r</sup> | 1,430 <sup>r</sup> | 5,500              |
| 2004                            | 4,200                | 1,470              | 5,670              | 122                      | 2                  | 124              | 4,320              | 1,470              | 5,790              |

<sup>r</sup>Revised.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes materials from wells, ponds, and pumping operations.

<sup>3</sup>Includes solution mining.

<sup>4</sup>Includes ore and waste from development operations.

<sup>5</sup>Less than ½ unit.

TABLE 2  
MATERIAL HANDLED AT SURFACE AND UNDERGROUND MINES IN THE UNITED STATES IN 2004, BY COMMODITY AND STATE<sup>1</sup>

| Commodity or State     | Number<br>of<br>mines <sup>2</sup> | Surface <sup>3</sup><br>(thousand metric tons) |                    |                      | Underground <sup>5</sup><br>(thousand metric tons) |                    |                    | All mines<br>(thousand metric tons) |                      |                        |
|------------------------|------------------------------------|--|--------------------|----------------------|--|--------------------|--------------------|-------------------------------------|----------------------|------------------------|
|                        |                                    | Crude ore                                      | Waste <sup>4</sup> | Total                | Crude ore  | Waste <sup>4</sup> | Total              | Crude ore                           | Waste <sup>4</sup>   | Total                  |
| Metal ore:             |                                    |  |                    |                      |  |                    |                    |                                     |                      |                        |
| Gold                   | 40                                 | 230,000  | 796,000            | 1,030,000            | 4,290  | 1,100              | 5,390              | 234,000                             | 797,000              | 1,030,000              |
| Iron                   | 10                                 | 177,000  | 126,000            | 303,000              | --   | --                 | --                 | 177,000                             | 126,000              | 303,000                |
| Other <sup>6</sup>     | 41                                 | 756,000  | 135,000            | 891,000              | 9,700  | 414                | 10,100             | 766,000                             | 135,000              | 901,000                |
| Total                  | 91                                 | 1,160,000                                      | 1,060,000          | 2,220,000            | 14,000   | 1,520              | 15,500             | 1,180,000                           | 1,060,000            | 2,240,000              |
| Industrial minerals:   |                                    |  |                    |                      |  |                    |                    |                                     |                      |                        |
| Barite                 | 5                                  | 778  | W                  | 778 <sup>7</sup>     | --   | --                 | --                 | 778                                 | W                    | 778 <sup>7</sup>       |
| Clays                  | 639                                | 40,400   | 35,100             | 75,500               | W  | (8)                | W                  | 40,400 <sup>9</sup>                 | 35,100 <sup>9</sup>  | 75,500 <sup>9</sup>    |
| Diatomite              | 10                                 | 620  | --                 | 620                  | --   | --                 | --                 | 620                                 | --                   | 620                    |
| Feldspar <sup>10</sup> | 12                                 | 1,480  | W                  | 1,480 <sup>7</sup>   | --   | --                 | --                 | 1,480                               | W                    | 1,480 <sup>7</sup>     |
| Gypsum                 | 36                                 | 13,900   | 3,530              | 17,400               | 1,730  | --                 | 1,730              | 15,600                              | 3,530                | 19,100                 |
| Phosphate rock         | 15                                 | 146,000  | W                  | 146,000 <sup>7</sup> | --   | --                 | --                 | 146,000                             | W                    | 146,000 <sup>7</sup>   |
| Pumice <sup>11</sup>   | 17                                 | 1,490  | 726                | 2,220                | --   | --                 | --                 | 1,490                               | 726                  | 2,220                  |
| Salt                   | 66                                 | 7,340  | --                 | 7,340                | 32,600   | --                 | 32,600             | 39,900                              | --                   | 39,900                 |
| Sand and gravel:       |                                    |  |                    |                      |  |                    |                    |                                     |                      |                        |
| Construction           | 10,164                             | 1,240,000                                      | --                 | 1,240,000            | --   | --                 | --                 | 1,240,000                           | --                   | 1,240,000              |
| Industrial             | 137                                | 29,100   | --                 | 29,100               | W  | --                 | W                  | 29,100 <sup>9</sup>                 | --                   | 29,100 <sup>9</sup>    |
| Soda ash               | 7                                  | --   | --                 | --                   | 11,000   | --                 | 11,000             | 11,000                              | --                   | 11,000                 |
| Stone:                 |                                    |  |                    |                      |  |                    |                    |                                     |                      |                        |
| Crushed                | 3,170                              | 1,550,000                                      | 118,000            | 1,660,000            | 47,700   | 324                | 48,100             | 1,590,000                           | 118,000              | 1,710,000              |
| Dimension              | 159                                | 1,470  | 744                | 2,210                | W  | --                 | W                  | 1,470 <sup>9</sup>                  | 744                  | 2,210 <sup>9</sup>     |
| Talc and pyrophyllite  | 15                                 | 656  | 2,410              | 3,070                | W  | --                 | W                  | 656 <sup>9</sup>                    | 2,410                | 3,070 <sup>9</sup>     |
| Other <sup>12</sup>    | 93                                 | 12,200   | 249,000            | 261,000              | 15,000   | --                 | 15,000             | 27,100                              | 249,000              | 276,000                |
| Total                  | 14,545                             | 3,040,000                                      | 409,000            | 3,450,000            | 108,000  | 324                | 108,000            | 3,150,000                           | 409,000              | 3,560,000              |
| Grand total            | 14,636                             | 4,200,000                                      | 1,470,000          | 5,670,000            | 122,000  | 1,840              | 124,000            | 4,320,000                           | 1,470,000            | 5,790,000              |
| State:                 |                                    |  |                    |                      |  |                    |                    |                                     |                      |                        |
| Alabama                | 181                                | 66,200   | 6,130              | 72,300               | W  | W                  | W                  | 66,200 <sup>9</sup>                 | 6,130 <sup>9</sup>   | 72,300 <sup>9</sup>    |
| Alaska                 | 211                                | 34,600   | 27,500             | 62,000               | W  | W                  | W                  | 34,600 <sup>9</sup>                 | 27,500 <sup>9</sup>  | 62,000 <sup>9</sup>    |
| Arizona                | 422                                | 488,000  | W                  | 488,000 <sup>7</sup> | W  | W                  | W                  | 488,000 <sup>9</sup>                | W                    | 488,000 <sup>7,9</sup> |
| Arkansas               | 153                                | 44,800   | 6,140              | 51,000               | W  | --                 | W                  | 44,800 <sup>9</sup>                 | 6,140                | 51,000 <sup>9</sup>    |
| California             | 861                                | 232,000  | 68,100             | 300,000              | W  | W                  | W                  | 232,000 <sup>9</sup>                | 68,100 <sup>9</sup>  | 300,000 <sup>9</sup>   |
| Colorado               | 385                                | 69,400   | 35,400             | 105,000              | W  | W                  | W                  | 69,400 <sup>9</sup>                 | 35,400 <sup>9</sup>  | 105,000 <sup>9</sup>   |
| Connecticut            | 97                                 | 18,400   | 876                | 19,300               | --   | --                 | --                 | 18,400                              | 876                  | 19,300                 |
| Delaware               | 11                                 | 2,980  | --                 | 2,980                | --   | --                 | --                 | 2,980                               | --                   | 2,980                  |
| Florida                | 188                                | 273,000  | W                  | 273,000 <sup>7</sup> | --   | --                 | --                 | 273,000                             | W                    | 273,000 <sup>7</sup>   |
| Georgia                | 245                                | 96,500   | 14,500             | 111,000              | 1,640  | 14                 | 1,660              | 98,200                              | 14,500               | 113,000                |
| Hawaii                 | 25                                 | 6,450  | 415                | 6,860                | --   | --                 | --                 | 6,450                               | 415                  | 6,860                  |
| Idaho                  | 399                                | 36,900   | W                  | 36,900 <sup>7</sup>  | W  | W                  | W                  | 36,900 <sup>9</sup>                 | W                    | 36,900 <sup>7,9</sup>  |
| Illinois               | 293                                | 115,000  | 5,860              | 121,000              | 5,430  | 38                 | 5,470              | 120,000                             | 5,900                | 126,000                |
| Indiana                | 274                                | 79,400   | 4,720              | 84,100               | 7,060  | 46                 | 7,110              | 86,500                              | 4,760                | 91,300                 |
| Iowa                   | 382                                | 47,600   | 2,680              | 50,300               | 7,220  | 45                 | 7,260              | 54,900                              | 2,720                | 57,600                 |
| Kansas                 | 345                                | 30,800   | 2,100              | 32,900               | 3,050  | 3                  | 3,050              | 33,900                              | 2,100                | 36,000                 |
| Kentucky               | 128                                | 54,400   | 4,310              | 58,700               | 12,300   | 86                 | 12,400             | 66,700                              | 4,400                | 71,100                 |
| Louisiana              | 151                                | 25,600   | 347                | 26,000               | 14,700   | --                 | 14,700             | 40,400                              | 347                  | 40,700                 |
| Maine                  | 181                                | 15,000   | 808                | 15,800               | --   | --                 | --                 | 15,000                              | 808                  | 15,800                 |
| Maryland               | 95                                 | 48,000   | 2,950              | 50,900               | W  | W                  | W                  | 48,000 <sup>9</sup>                 | 2,950 <sup>9</sup>   | 50,900 <sup>9</sup>    |
| Massachusetts          | 146                                | 27,100   | 1,070              | 28,200               | --   | --                 | --                 | 27,100                              | 1,070                | 28,200                 |
| Michigan               | 585                                | 147,000  | W                  | 147,000 <sup>7</sup> | 2,040  | --                 | 2,040              | 149,000                             | W                    | 149,000 <sup>7</sup>   |
| Minnesota              | 588                                | 199,000  | 87,400             | 287,000              | --   | --                 | --                 | 199,000                             | 87,400               | 287,000                |
| Mississippi            | 119                                | 18,000   | 1,120              | 19,200               | W  | W                  | W                  | 18,000 <sup>9</sup>                 | 1,120 <sup>9</sup>   | 19,200 <sup>9</sup>    |
| Missouri               | 298                                | 79,400   | 6,490              | 85,900               | 8,200  | 25                 | 8,230              | 87,600                              | 6,510                | 94,100                 |
| Montana                | 238                                | 38,700   | W                  | 38,700 <sup>7</sup>  | 1,370  | W                  | 1,370 <sup>7</sup> | 40,100                              | W                    | 40,100 <sup>7,9</sup>  |
| Nebraska               | 170                                | 22,000   | 668                | 22,700               | W  | --                 | W                  | 22,000 <sup>9</sup>                 | 668                  | 22,700 <sup>9</sup>    |
| Nevada                 | 859                                | 477,000  | 591,000            | 1,070,000            | W  | W                  | W                  | 477,000 <sup>9</sup>                | 591,000 <sup>9</sup> | 1,070,000 <sup>9</sup> |

See footnotes at end of table.

TABLE 2—Continued

MATERIAL HANDLED AT SURFACE AND UNDERGROUND MINES IN THE UNITED STATES IN 2004, BY COMMODITY AND STATE<sup>1</sup>

| Commodity or State          | Number<br>of<br>mines <sup>2</sup> | Surface <sup>3</sup><br>(thousand metric tons) |                    |                     | Underground <sup>5</sup><br>(thousand metric tons) |                    |                    | All mines<br>(thousand metric tons) |                     |                       |
|-----------------------------|------------------------------------|--|--------------------|---------------------|--|--------------------|--------------------|-------------------------------------|---------------------|-----------------------|
|                             |                                    | Crude ore                                      | Waste <sup>4</sup> | Total               | Crude ore  | Waste <sup>4</sup> | Total              | Crude ore                           | Waste <sup>4</sup>  | Total                 |
| State—Continued:            |                                    |  |                    |                     |  |                    |                    |                                     |                     |                       |
| New Hampshire               | 103                                | 13,700   | 397                | 14,100              | --   | --                 | --                 | 13,700                              | 397                 | 14,100                |
| New Jersey                  | 93                                 | 47,500   | 2,100              | 49,600              | --   | --                 | --                 | 47,500                              | 2,100               | 49,600                |
| New Mexico                  | 524                                | 57,600   | W                  | 57,600 <sup>7</sup> | 12,300   | --                 | 12,300             | 69,900                              | W                   | 69,900 <sup>7</sup>   |
| New York                    | 730                                | 84,800   | 5,080              | 89,900              | 3,890  | W                  | 3,890 <sup>7</sup> | 88,700                              | 5,080 <sup>9</sup>  | 93,800                |
| North Carolina              | 267                                | 94,600   | 10,200             | 105,000             | 34   | (13)               | 34                 | 94,700                              | 10,200              | 105,000               |
| North Dakota                | 169                                | 11,900   | W                  | 11,900 <sup>7</sup> | --   | --                 | --                 | 11,900                              | W                   | 11,900 <sup>7</sup>   |
| Ohio                        | 368                                | 129,000  | 7,070              | 136,000             | W  | W                  | W                  | 129,000 <sup>9</sup>                | 7,070 <sup>9</sup>  | 136,000 <sup>9</sup>  |
| Oklahoma                    | 173                                | 56,700   | 4,150              | 60,800              | W  | W                  | W                  | 56,700 <sup>9</sup>                 | 4,150 <sup>9</sup>  | 60,800 <sup>9</sup>   |
| Oregon                      | 349                                | 44,400   | 2,630              | 47,000              | --   | --                 | --                 | 44,400                              | 2,630               | 47,000                |
| Pennsylvania                | 352                                | 130,000  | 9,090              | 139,000             | 3,220  | 23                 | 3,240              | 133,000                             | 9,110               | 142,000               |
| Rhode Island                | 28                                 | 4,240  | 128                | 4,370               | --   | --                 | --                 | 4,240                               | 128                 | 4,370                 |
| South Carolina              | 117                                | 40,600   | 3,260              | 43,800              | W  | W                  | W                  | 40,600 <sup>9</sup>                 | 3,260 <sup>9</sup>  | 43,800 <sup>9</sup>   |
| South Dakota                | 335                                | 22,200   | 20,100             | 42,300              | --   | --                 | --                 | 22,200                              | 20,100              | 42,300                |
| Tennessee                   | 211                                | 65,200   | 5,370              | 70,600              | 2,570  | W                  | 2,570 <sup>7</sup> | 67,800                              | 5,370 <sup>9</sup>  | 73,100                |
| Texas                       | 557                                | 209,000  | 10,900             | 220,000             | 5,520  | W                  | 5,520 <sup>7</sup> | 215,000                             | 10,900 <sup>9</sup> | 226,000               |
| Utah                        | 382                                | 89,000   | W                  | 89,000 <sup>7</sup> | 642  | W                  | 642 <sup>7</sup>   | 89,700                              | W                   | 89,700 <sup>7,9</sup> |
| Vermont                     | 119                                | 9,980  | 430                | 10,400              | W  | --                 | W                  | 9,980 <sup>9</sup>                  | 430                 | 10,400 <sup>9</sup>   |
| Virginia                    | 220                                | 89,700   | 10,300             | 100,000             | --   | W                  | W                  | 89,700                              | 10,300 <sup>9</sup> | 100,000 <sup>9</sup>  |
| Washington                  | 342                                | 53,800   | 1,050              | 54,800              | W  | --                 | W                  | 53,800 <sup>9</sup>                 | 1,050               | 54,800 <sup>9</sup>   |
| West Virginia               | 58                                 | 13,100   | 937                | 14,100              | 3,150  | W                  | 3,150 <sup>7</sup> | 16,300                              | 937 <sup>9</sup>    | 17,200                |
| Wisconsin                   | 714                                | 83,200   | 3,090              | 86,300              | --   | --                 | --                 | 83,200                              | 3,090               | 86,300                |
| Wyoming                     | 395                                | 21,100   | 3,660              | 24,800              | 9,770  | --                 | 9,770              | 30,900                              | 3,660               | 34,600                |
| Undistributed <sup>14</sup> | --                                 | 38,000   | 496,000            | 534,000             | 17,800   | 1,560              | 19,300             | 55,800                              | 497,000             | 553,000               |
| Total                       | 14,636                             | 4,200,000                                      | 1,470,000          | 5,670,000           | 122,000  | 1,840              | 124,000            | 4,320,000                           | 1,470,000           | 5,790,000             |

W Withheld to avoid disclosing company proprietary data; included with "Other" or "Undistributed." -- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits except "number of mines;" may not add to totals shown.<sup>2</sup>Includes quarries and other mineral operations.<sup>3</sup>Includes materials from wells, ponds, and pumping operations.<sup>4</sup>Includes ore and waste from development operations.<sup>5</sup>Includes solution mining.<sup>6</sup>Includes beryllium, copper, gold-silver, lead, magnesium metal, molybdenum, platinum and palladium, silver, titanium, uranium, zinc, and metals indicated by symbol W.<sup>7</sup>Excludes waste from mining operations and ore and waste from development operations.<sup>8</sup>Withheld to avoid disclosing company proprietary data; included with "Grand total."<sup>9</sup>Excludes materials from underground operations.<sup>10</sup>Includes aplite.<sup>11</sup>Excludes volcanic cinder and scoria; included with "Crushed stone."<sup>12</sup>Includes abrasives, boron minerals, bromine, garnet, greensand marl, iodine, iron oxide pigments, kyanite, lithium minerals, magnesite, magnesium compounds, mica, olivine, perlite, potash, tripoli, vermiculite, wollastonite, zeolites, and industrial minerals indicated by symbol W.<sup>13</sup>Less than ½ unit.<sup>14</sup>Includes States indicated by symbol W.

TABLE 3

VALUE OF PRINCIPAL MINERAL PRODUCTS AND BYPRODUCTS OF SURFACE AND UNDERGROUND MINES IN THE UNITED STATES IN 2004<sup>1</sup>

(Dollars per metric ton)

| Commodity   | Surface                   |           |                    | Underground               |           |        | All mines                 |                   |                     |
|---|---------------------------|-----------|--------------------|---------------------------|-----------|--------|---------------------------|-------------------|---------------------|
|   | Principal mineral product | Byproduct | Total              | Principal mineral product | Byproduct | Total  | Principal mineral product | Byproduct         | Total               |
| <b>Metal ore:</b>   |                           |           |                    |                           |           |        |                           |                   |                     |
| Gold  | 13.49                     | 0.30      | 13.79              | W                         | W         | W      | 13.49 <sup>2</sup>        | 0.30 <sup>2</sup> | 13.79 <sup>2</sup>  |
| Iron  | 16.35                     | --        | 16.35              | --                        | --        | --     | 16.35                     | --                | 16.35               |
| Average, metals <sup>3</sup>  | 10.76                     | 0.80      | 11.56              | 186.66                    | 18.11     | 204.77 | 13.60                     | 1.08              | 14.68               |
| <b>Industrial minerals:</b>   |                           |           |                    |                           |           |        |                           |                   |                     |
| Barite  | 26.70                     | --        | 26.70              | --                        | --        | --     | 26.70                     | --                | 26.70               |
| Clays   | 41.11                     | --        | 41.11              | W                         | --        | W      | 41.11 <sup>2</sup>        | --                | 41.11 <sup>2</sup>  |
| Feldspar <sup>4</sup>   | 25.89                     | W         | 25.89 <sup>5</sup> | --                        | --        | --     | 25.89                     | W                 | 25.89 <sup>2</sup>  |
| Gypsum  | 6.79                      | --        | 6.79               | 9.29                      | --        | 9.29   | 7.07                      | --                | 7.07                |
| Phosphate rock  | 6.84                      | --        | 6.84               | --                        | --        | --     | 6.84                      | --                | 6.84                |
| Pumice <sup>6</sup>   | 16.82                     | --        | 16.82              | --                        | --        | --     | 16.82                     | --                | 16.82               |
| Salt  | 64.83                     | --        | 64.83              | 18.98                     | --        | 18.98  | 26.22                     | --                | 26.22               |
| <b>Sand and gravel:</b>   |                           |           |                    |                           |           |        |                           |                   |                     |
| Construction  | 5.33                      | --        | 5.33               | --                        | --        | --     | 5.33                      | --                | 5.33                |
| Industrial  | 23.18                     | --        | 23.18              | W                         | --        | W      | 23.18 <sup>2</sup>        | --                | 23.18 <sup>2</sup>  |
| Soda ash  | --                        | --        | --                 | 70.27                     | --        | 70.27  | 70.27                     | --                | 70.27               |
| <b>Stone:</b>   |                           |           |                    |                           |           |        |                           |                   |                     |
| Crushed   | 6.01                      | --        | 6.01               | 6.10                      | --        | 6.10   | 6.01                      | --                | 6.01                |
| Dimension   | 181.48                    | --        | 181.48             | W                         | --        | W      | 181.48 <sup>2</sup>       | --                | 181.48 <sup>2</sup> |
| Talc and pyrophyllite   | 27.38                     | --        | 27.38              | W                         | --        | W      | 27.38 <sup>2</sup>        | --                | 27.38 <sup>2</sup>  |
| Average, industrial minerals <sup>7</sup>   | 7.04                      | 0.03      | 7.07               | 19.22                     | 0.18      | 19.40  | 7.48                      | 0.03              | 7.51                |
| Average, industrial minerals, excluding sand and gravel and stone <sup>7</sup>              | 20.54                     | 0.21      | 20.75              | 28.34                     | 0.32      | 28.66  | 22.30                     | 0.23              | 22.53               |
| Average, metals and industrial minerals <sup>3,7</sup>                                      | 7.86                      | 0.20      | 8.06               | 37.77                     | 2.17      | 39.94  | 8.81                      | 0.26              | 9.07                |
| Average, metals and industrial minerals, excluding sand and gravel and stone <sup>3,7</sup> | 12.78                     | 0.68      | 13.46              | 56.25                     | 3.45      | 59.70  | 15.77                     | 0.87              | 16.64               |

W Withheld to avoid disclosing company proprietary data; included in appropriate "Average." -- Zero.

<sup>1</sup>Values calculated from unrounded data; may not add to totals shown because of independent rounding.<sup>2</sup>Value of products at surface operations only.<sup>3</sup>Includes values of copper, gold-silver ore, lead, magnesium metal, molybdenum, platinum and palladium, silver, titanium, zinc, and metals indicated by symbol W.<sup>4</sup>Includes aplite.<sup>5</sup>Value of principal mineral product only.<sup>6</sup>Excludes volcanic cinder and scoria; included with "Crushed stone."<sup>7</sup>Includes values of abrasives, boron minerals, bromine, garnet, greensand marl, iodine, iron oxide pigments, kyanite, lithium minerals, magnesite, magnesium compounds, mica, olivine, perlite, potash, tripoli, vermiculite, wollastonite, zeolites, and industrial minerals indicated by symbol W.

TABLE 4  
 TWENTY-FIVE LEADING METAL AND INDUSTRIAL MINERAL MINES AND QUARRIES IN THE UNITED STATES IN 2004,  
 IN ORDER OF OUTPUT OF CRUDE ORE

| Type of ore and name<br>of mine, quarry, or operation <sup>1</sup> | State          | Operator                                    | Commodity             | Mining method         |
|--|----------------|---|-----------------------|-----------------------|
| <b>Metal ore:</b>  |                |   |                       |                       |
| Morenci  | Arizona        | Phelps Dodge Corp.                          | Copper-molybdenum ore | Open pit.             |
| Newmont Nevada Operations <sup>2</sup>                             | Nevada         | Newmont Mining Corp.                        | Gold ore              | Open pit and stoping. |
| Betze-Post   | do.            | Barrick Goldstrike Mines, Inc.              | do.                   | Open pit.             |
| Bagdad   | Arizona        | Phelps Dodge Corp.                          | Copper ore            | Do.                   |
| Ray  | do.            | ASARCO Incorporated                         | do.                   | Do.                   |
| Sierrita   | do.            | Phelps Dodge Corp.                          | Copper-molybdenum ore | Do.                   |
| Minntac  | Minnesota      | U.S. Steel Corporation                      | Iron ore              | Do.                   |
| Bingham Canyon   | Utah           | Kennecott Utah Copper Corp.                 | Copper ore            | Do.                   |
| Chino  | New Mexico     | Phelps Dodge Corp.                          | Copper-molybdenum ore | Do.                   |
| Cortez   | Nevada         | Placer Dome U.S. Inc.                       | Gold ore              | Do.                   |
| Round Mountain   | do.            | Round Mountain Gold Corporation             | do.                   | Do.                   |
| Hibbing Taconite Co.   | Minnesota      | Cleveland-Cliffs, Inc.                      | Iron ore              | Do.                   |
| Tilden Mining Co.  | Michigan       | do.   | do.                   | Do.                   |
| Mission Complex  | Arizona        | ASARCO Incorporated                         | Copper ore            | Open pit and stoping. |
| Keewatin Taconite  | Minnesota      | U.S. Steel Corporation                      | Iron ore              | Open pit.             |
| Cresson  | Colorado       | Cripple Creek & Victor Gold Mining Co.      | Gold ore              | Do.                   |
| Empire Iron Mining Partnership                                     | Michigan       | Cleveland-Cliffs, Inc.                      | Iron ore              | Do.                   |
| Florida Canyon and Standard  | Nevada         | Apollo Gold Corp.                           | Gold ore              | Do.                   |
| Fort Knox and True North Mines                                     | Alaska         | Kinnross Fairbanks Gold Mining Incorporated | do.                   | Do.                   |
| Continental Pit  | Montana        | Montana Resources, Inc.                     | Copper-molybdenum ore | Do.                   |
| Peter Mitchell Mine  | Minnesota      | Northshore Mining Co.                       | Iron ore              | Do.                   |
| United Taconite Company, LLC                                       | do.            | United Taconite Company, LLC                | do.                   | Do.                   |
| Iluka Green Cove Springs FL  | Florida        | Iluka Resources Inc.                        | Titanium ore          | Dredging.             |
| Rochester  | Nevada         | Coeur Rochester, Inc.                       | Gold ore              | Open pit.             |
| Robinson   | do.            | Robinson Nevada Mining Company              | do.                   | Do.                   |
| <b>Industrial minerals:</b>  |                |   |                       |                       |
| Florida mines (seven)  | Florida        | Mosaic Co., The                             | Phosphate rock        | Do.                   |
| South Pasture  | do.            | CF Industries, Inc.                         | do.                   | Do.                   |
| F.E.C. Quarry  | do.            | Rinker Materials Corporation                | Stone                 | Open quarry.          |
| Swift Creek  | do.            | PCS Phosphate Co., Inc.                     | Phosphate rock        | Open pit.             |
| White Rock   | do.            | Vecellio & Grogan, Inc.                     | Stone                 | Open quarry.          |
| Georgetown   | Texas          | Texas Crushed Stone Co., Inc.               | do.                   | Do.                   |
| Aurora   | North Carolina | PCS Phosphate Co., Inc.                     | Phosphate rock        | Open pit.             |
| Pennsuco   | Florida        | Titan Atlantic LLC (Tarmac America, Inc.)   | Stone                 | Open quarry.          |
| Crushed Limestone Operation  | Missouri       | Tower Rock Stone Co.                        | do.                   | Do.                   |
| McCook 378   | Illinois       | Vulcan Materials Co.                        | do.                   | Do.                   |
| Mosaic Co., The  | New Mexico     | Mosaic Co., The                             | Potash                | Stoping.              |
| Alico Quarry   | Florida        | Rinker Materials Corporation                | Stone                 | Open quarry.          |
| Thorton Quarry   | Illinois       | Material Service Corporation                | do.                   | Do.                   |
| Stoneport Quarry   | Michigan       | Lafarge North America, Inc.                 | do.                   | Do.                   |
| TXI Operations, LP   | Texas          | Texas Industries, Inc.                      | do.                   | Do.                   |
| Grand Rivers Quarry  | Kentucky       | Vulcan Materials Co.                        | do.                   | Do.                   |
| Balcones Plant   | Texas          | Cemex, Inc.                                 | do.                   | Do.                   |
| OMYA CA Inc.   | California     | Pluess-Stauffer (CA) Industries, Inc.       | do.                   | Do.                   |
| Krome Quarry   | Florida        | Rinker Materials Corporation                | do.                   | Do.                   |
| Macon Quarry   | Georgia        | do.   | do.                   | Do.                   |
| Prairie Materials Sales, Inc.                                      | Illinois       | Prairie Materials Sales, Inc.               | Sand and gravel       | Open pit.             |
| Lytle Creek  | California     | Cemex, Inc.                                 | do.                   | Do.                   |
| Clinton Plant  | New York       | Oldcastle Inc./Materials Group              | Stone                 | Open quarry.          |
| TXI Operations, LP   | Oklahoma       | Texas Industries, Inc.                      | do.                   | Do.                   |
| Dupont Pit   | Washington     | Glacier Northwest, Inc.                     | Sand and gravel       | Open pit.             |

<sup>1</sup>Owing to commodity reporting differences, the rank of individual mining operations may not be available.

<sup>2</sup>Includes Battle Mountain Gold complex, Carlin Mines complex, Lone Tree complex, Twin Creeks Mine, and Midas Mine; ore was mined from 13 open pit mines and 4 underground mines.

TABLE 5  
 TWENTY-FIVE LEADING METAL AND INDUSTRIAL MINERAL MINES AND QUARRIES IN THE UNITED STATES IN 2004,  
 IN ORDER OF OUTPUT OF TOTAL MATERIAL HANDLED

| Type of ore and name<br>of mine, quarry, or operation <sup>1</sup> | State          | Operator                                  | Commodity             | Mining method         |
|--|----------------|---|-----------------------|-----------------------|
| Metal ore:   |                |   |                       |                       |
| Betze-Post   | Nevada         | Barrick Goldstrike Mines, Inc.            | Gold ore              | Open pit.             |
| Newmont Nevada Operations <sup>2</sup>                             | do.            | Newmont Mining Corp.                      | do.                   | Open pit and stoping. |
| Morenci  | Arizona        | Phelps Dodge Corp.                        | Copper-molybdenum ore | Open pit.             |
| Ray  | do.            | ASARCO Incorporated                       | Copper ore            | Do.                   |
| Bingham Canyon   | Utah           | Kennecott Utah Copper Corp.               | do.                   | Do.                   |
| Bagdad   | Arizona        | Phelps Dodge Corp.                        | do.                   | Do.                   |
| Minnnac  | Minnesota      | U.S. Steel Corporation                    | Iron ore              | Do.                   |
| Cortez   | Nevada         | Placer Dome U.S. Inc.                     | Gold ore              | Do.                   |
| Mission Complex  | Arizona        | ASARCO Incorporated                       | Copper ore            | Open pit and stoping. |
| Robinson   | Nevada         | Robinson Nevada Mining Company            | Gold ore              | Open pit.             |
| Chino  | New Mexico     | Phelps Dodge Corp.                        | Copper-molybdenum ore | Do.                   |
| Cresson  | Colorado       | Cripple Creek & Victor Gold Mining Co.    | Gold ore              | Do.                   |
| Round Mountain   | Nevada         | Round Mountain Gold Corporation           | do.                   | Do.                   |
| Hibbing Taconite Co.   | Minnesota      | Cleveland-Cliffs, Inc.                    | Iron ore              | Do.                   |
| Sierrita   | Arizona        | Phelps Dodge Corp.                        | Copper-molybdenum ore | Do.                   |
| Fort Knox and True North Mines                                     | Alaska         | Fairbanks Gold Mining Inc.                | Gold ore              | Do.                   |
| Empire Iron Mining Partnership                                     | Michigan       | Cleveland-Cliffs, Inc.                    | Iron ore              | Do.                   |
| Marigold   | Nevada         | Glamis Gold Inc.                          | Gold ore              | Do.                   |
| Tilden Mining Co.  | Michigan       | Cleveland-Cliffs, Inc.                    | Iron ore              | Do.                   |
| Florida Canyon and Standard  | Nevada         | Apollo Gold Corp.                         | Gold ore              | Do.                   |
| Montana Tunnels  | Montana        | Montana Tunnels Mining, Inc.              | do.                   | Do.                   |
| Keewatin Taconite  | Minnesota      | U.S. Steel Corporation                    | Iron ore              | Do.                   |
| Peter Mitchell Mine  | do.            | Northshore Mining Co.                     | do.                   | Do.                   |
| Wharf  | South Dakota   | Wharf Resources, Ltd.                     | Gold ore              | Do.                   |
| United Taconite Company, LLC                                       | Minnesota      | United Taconite Company, LLC              | Iron ore              | Do.                   |
| Industrial minerals:   |                |   |                       |                       |
| Florida mines (seven)  | Florida        | Mosaic Co., The                           | Phosphate rock        | Do.                   |
| Boron Mine   | California     | U.S. Borax, Inc.                          | Boron                 | Do.                   |
| F.E.C. Quarry  | Florida        | Rinker Materials Corporation              | Stone                 | Open quarry.          |
| South Pasture  | do.            | CF Industries, Inc.                       | Phosphate rock        | Open pit.             |
| Swift Creek  | do.            | PCS Phosphate Co., Inc.                   | do.                   | Do.                   |
| Aurora   | North Carolina | do.                                       | do.                   | Do.                   |
| White Rock   | Florida        | Vecellio & Grogan, Inc.                   | Stone                 | Open quarry.          |
| Georgetown   | Texas          | Texas Crushed Stone Co., Inc.             | do.                   | Do.                   |
| Pennsuco   | Florida        | Titan Atlantic LLC (Tarmac America, Inc.) | do.                   | Do.                   |
| Crushed Limestone Operation  | Missouri       | Tower Rock Stone Co.                      | do.                   | Do.                   |
| McCook 378   | Illinois       | Vulcan Materials Co.                      | do.                   | Do.                   |
| Alico Quarry   | Florida        | Rinker Materials Corporation              | do.                   | Do.                   |
| Thorton Quarry   | Illinois       | Material Service Corporation              | do.                   | Do.                   |
| Stoneport Quarry   | Michigan       | Lafarge North America, Inc.               | do.                   | Do.                   |
| Mosaic Co., The  | New Mexico     | Mosaic Co., The                           | Potash                | Stoping.              |
| TXI Operations, LP   | Texas          | Texas Industries, Inc.                    | Stone                 | Open quarry.          |
| Grand Rivers Quarry  | Kentucky       | Vulcan Materials Co.                      | do.                   | Do.                   |
| Balcones Plant   | Texas          | Cemex, Inc.                               | do.                   | Do.                   |
| OMYA CA Inc.   | California     | Pluess-Stauffer (CA) Industries, Inc.     | do.                   | Do.                   |
| Krome Quarry   | Florida        | Rinker Materials Corporation              | do.                   | Do.                   |
| Macon Quarry   | Georgia        | do.                                       | do.                   | Do.                   |
| Clinton Plant  | New York       | Oldcastle Inc./Materials Group            | do.                   | Do.                   |
| Prairie Materials Sales, Inc.                                      | Illinois       | Prairie Materials Sales, Inc.             | Sand and gravel       | Open pit.             |
| TXI Operations, LP   | Oklahoma       | Texas Industries, Inc.                    | Stone                 | Open quarry.          |
| Lytle Creek  | California     | Cemex, Inc.                               | do.                   | Do.                   |

<sup>1</sup>Owing to commodity reporting differences, the rank of individual mining operations may not be available.

<sup>2</sup>Includes Battle Mountain Gold complex, Carlin Mines complex, Lone Tree complex, Twin Creeks Mine, and Midas Mine; ore was mined from 13 open pit mines and 4 underground mines.

TABLE 6  
MARKETABLE PRODUCT AND ORE TREATED OR SOLD AT SURFACE AND UNDERGROUND MINES  
IN THE UNITED STATES IN 2004, BY SELECTED COMMODITY AND STATE<sup>1</sup>

(Thousand metric tons)

| Commodity or State          | Marketable product |             |           | Ore treated or sold |             |           |
|-----------------------------|--------------------|-------------|-----------|---------------------|-------------|-----------|
|                             | Surface            | Underground | Total     | Surface             | Underground | Total     |
| <b>Metal ore:</b>           |                    |             |           |                     |             |           |
| Gold                        | W                  | W           | W         | 205,000             | 4,290       | 209,000   |
| Iron ore, usable            | 54,900             | --          | 54,900    | 127,000             | --          | 127,000   |
| <b>Industrial minerals:</b> |                    |             |           |                     |             |           |
| Barite                      | W                  | --          | W         | 700                 | --          | 700       |
| Clays                       | 40,400             | (2)         | 40,400    | 40,400              | (3)         | 40,400    |
| Diatomite                   | 620                | --          | 620       | 620                 | --          | 620       |
| Feldspar <sup>4</sup>       | 1,410              | --          | 1,410     | 1,590               | --          | 1,590     |
| Gypsum                      | 13,900             | 1,730       | 15,600    | 13,900              | 1,730       | 15,600    |
| Phosphate rock              | 35,800             | --          | 35,800    | 146,000             | --          | 146,000   |
| Pumice <sup>5</sup>         | 1,490              | --          | 1,490     | 1,490               | --          | 1,490     |
| Salt                        | (6)                | 37,500      | 37,500    | (7)                 | 38,500      | 38,500    |
| <b>Sand and gravel:</b>     |                    |             |           |                     |             |           |
| Construction                | 1,240,000          | --          | 1,240,000 | 1,240,000           | --          | 1,240,000 |
| Industrial                  | 29,100             | (2)         | 29,100    | 29,100              | (3)         | 29,100    |
| Soda ash                    | --                 | 11,000      | 11,000    | --                  | 11,000      | 11,000    |
| <b>Stone:</b>               |                    |             |           |                     |             |           |
| Crushed                     | 1,550,000          | 47,700      | 1,590,000 | 1,550,000           | 47,700      | 1,590,000 |
| Dimension                   | 1,470              | (2)         | 1,470     | 1,460               | (3)         | 1,460     |
| Talc and pyrophyllite       | 672                | (2)         | 672       | 681                 | (3)         | 681       |
| <b>State:</b>               |                    |             |           |                     |             |           |
| Alabama                     | 66,900             | (2)         | 66,900    | 66,900              | (3)         | 66,900    |
| Alaska                      | 12,400             | (2)         | 12,400    | 27,600              | (3)         | 27,600    |
| Arizona                     | 92,100             | (2)         | 92,100    | 488,000             | (3)         | 488,000   |
| Arkansas                    | 45,000             | (2)         | 45,000    | 45,000              | (3)         | 45,000    |
| California                  | 229,000            | (2)         | 229,000   | 233,000             | (3)         | 233,000   |
| Colorado                    | 52,700             | (2)         | 52,700    | 72,100              | (3)         | 72,100    |
| Connecticut                 | 18,400             | --          | 18,400    | 18,400              | --          | 18,400    |
| Delaware                    | 2,980              | --          | 2,980     | 2,980               | --          | 2,980     |
| Florida                     | 160,000            | --          | 160,000   | 264,000             | --          | 264,000   |
| Georgia                     | 97,800             | 1,640       | 99,400    | 98,000              | 1,640       | 99,600    |
| Hawaii                      | 6,450              | --          | 6,450     | 6,450               | --          | 6,450     |
| Idaho                       | 27,600             | (2)         | 27,600    | 37,100              | (3)         | 37,100    |
| Illinois                    | 115,000            | 5,430       | 120,000   | 115,000             | 5,430       | 120,000   |
| Indiana                     | 79,600             | (2)         | 79,600    | 79,600              | (3)         | 79,600    |
| Iowa                        | 48,900             | 7,220       | 56,100    | 48,900              | 7,220       | 56,100    |
| Kansas                      | 31,200             | 3,040       | 34,300    | 31,200              | 3,040       | 34,300    |
| Kentucky                    | 54,700             | 12,300      | 67,000    | 54,700              | 12,300      | 67,000    |
| Louisiana                   | 25,500             | 13,300      | 38,800    | 26,300              | 14,100      | 40,400    |
| Maine                       | 14,600             | --          | 14,600    | 14,600              | --          | 14,600    |
| Maryland                    | 48,000             | (2)         | 48,000    | 48,000              | (3)         | 48,000    |
| Massachusetts               | 27,400             | --          | 27,400    | 27,400              | --          | 27,400    |
| Michigan                    | 122,000            | 1,730       | 124,000   | 147,000             | 1,950       | 149,000   |
| Minnesota                   | 109,000            | --          | 109,000   | 153,000             | --          | 153,000   |
| Mississippi                 | 18,100             | (2)         | 18,100    | 18,100              | (3)         | 18,100    |
| Missouri                    | 79,600             | 3,760       | 83,300    | 79,600              | 8,200       | 87,800    |
| Montana                     | 18,900             | (2)         | 18,900    | 39,500              | (3)         | 39,500    |
| Nebraska                    | 22,100             | (2)         | 22,100    | 22,100              | (3)         | 22,100    |
| Nevada                      | 56,300             | (2)         | 56,300    | 236,000             | (3)         | 236,000   |
| New Hampshire               | 13,700             | --          | 13,700    | 13,700              | --          | 13,700    |
| New Jersey                  | 47,700             | --          | 47,700    | 47,700              | --          | 47,700    |
| New Mexico                  | 18,600             | (2)         | 18,600    | 59,400              | (3)         | 59,400    |

See footnotes at end of table.



TABLE 6—Continued  
MARKETABLE PRODUCT AND ORE TREATED OR SOLD AT SURFACE AND UNDERGROUND MINES  
IN THE UNITED STATES IN 2004, BY SELECTED COMMODITY AND STATE<sup>1</sup>

(Thousand metric tons)

| Commodity or State | Marketable product |             |         | Ore treated or sold |             |         |
|--------------------|--------------------|-------------|---------|---------------------|-------------|---------|
|                    | Surface            | Underground | Total   | Surface             | Underground | Total   |
| State—Continued:   |                    |             |         |                     |             |         |
| New York           | 85,700             | 6,370       | 92,100  | 85,700              | 6,370       | 92,100  |
| North Carolina     | 89,800             | (2)         | 89,800  | 95,000              | (3)         | 95,000  |
| North Dakota       | 12,100             | --          | 12,100  | 12,100              | --          | 12,100  |
| Ohio               | 129,000            | (2)         | 129,000 | 129,000             | (3)         | 129,000 |
| Oklahoma           | 56,900             | (2)         | 56,900  | 56,900              | (3)         | 56,900  |
| Oregon             | 44,500             | --          | 44,500  | 44,500              | --          | 44,500  |
| Pennsylvania       | 130,000            | (2)         | 130,000 | 130,000             | (3)         | 130,000 |
| Rhode Island       | 4,240              | --          | 4,240   | 4,240               | --          | 4,240   |
| South Carolina     | 40,600             | (2)         | 40,600  | 40,600              | (3)         | 40,600  |
| South Dakota       | 19,700             | --          | 19,700  | 22,400              | --          | 22,400  |
| Tennessee          | 65,400             | (2)         | 65,400  | 66,200              | (3)         | 66,200  |
| Texas              | 211,000            | 9,430       | 221,000 | 212,000             | 9,600       | 221,000 |
| Utah               | 41,600             | (2)         | 41,600  | 89,100              | (3)         | 89,100  |
| Vermont            | 10,000             | (2)         | 10,000  | 10,000              | (3)         | 10,000  |
| Virginia           | 87,100             | --          | 87,100  | 87,100              | --          | 87,100  |
| Washington         | 54,300             | (2)         | 54,300  | 54,300              | (3)         | 54,300  |
| West Virginia      | 13,300             | 3,150       | 16,500  | 13,300              | 3,150       | 16,500  |
| Wisconsin          | 83,500             | --          | 83,500  | 83,500              | --          | 83,500  |
| Wyoming            | 21,100             | 9,770       | 30,900  | 21,100              | 9,770       | 30,900  |

W Withheld to avoid disclosing company proprietary data. -- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Withheld to avoid disclosing company proprietary data; included in "Marketable product, surface."

<sup>3</sup>Withheld to avoid disclosing company proprietary data; included in "Ore treated or sold, surface."

<sup>4</sup>Includes aplite.

<sup>5</sup>Excludes volcanic cinder and scoria; included with "Crushed stone."

<sup>6</sup>Withheld to avoid disclosing company proprietary data; included in "Marketable product, underground."

<sup>7</sup>Withheld to avoid disclosing company proprietary data; included in "Ore treated or sold, underground."

TABLE 7  
MINING METHODS USED AT SURFACE OPERATIONS IN THE UNITED STATES  
BY COMMODITY, IN 2004

(Percentage of total material handled)

| Commodity             | Preceded by drilling<br>and blasting | Not preceded by drilling<br>and blasting <sup>1</sup> |
|-----------------------|--------------------------------------|---|
| Metal ore:            |                                      |   |
| Beryllium             | 100                                  | --  |
| Copper                | 98                                   | 2   |
| Gold                  | 99                                   | 1   |
| Gold-silver           | 100                                  | --  |
| Iron                  | 99                                   | 1   |
| Magnesium metal       | 100                                  | --  |
| Molybdenum            | 100                                  | --  |
| Silver                | 100                                  | --  |
| Titanium              | --                                   | 100   |
| Uranium               | --                                   | 100   |
| Zinc                  | 100                                  | --  |
| Industrial minerals:  |                                      |   |
| Abrasives             | 100                                  | --  |
| Barite                | 2                                    | 98  |
| Boron minerals        | 100                                  | --  |
| Bromine               | 2                                    | 98  |
| Clays                 | --                                   | 100   |
| Diatomite             | --                                   | 100   |
| Feldspar <sup>2</sup> | 53                                   | 47  |
| Garnet                | 54                                   | 46  |
| Greensand marl        | --                                   | 100   |
| Gypsum                | 98                                   | 2   |
| Iodine                | --                                   | 100   |
| Iron oxide pigments   | --                                   | 100   |
| Kyanite               | 100                                  | --  |
| Lithium minerals      | --                                   | 100   |
| Magnesite             | 100                                  | --  |
| Magnesium compounds   | --                                   | 100   |
| Mica, scrap           | 28                                   | 72  |
| Olivine               | 46                                   | 54  |
| Perlite               | 33                                   | 67  |
| Phosphate rock        | 3                                    | 97  |
| Potash                | --                                   | 100   |
| Pumice <sup>3</sup>   | 13                                   | 87  |
| Salt                  | --                                   | 100   |
| Sand and gravel:      |                                      |   |
| Construction          | --                                   | 100   |
| Industrial            | --                                   | 100   |
| Stone:                |                                      |   |
| Crushed               | 99                                   | 1   |
| Dimension             | --                                   | 100   |
| Talc and pyrophyllite | 91                                   | 9   |
| Tripoli               | 63                                   | 37  |
| Vermiculite           | 29                                   | 71  |
| Wollastonite          | 100                                  | --  |
| Zeolites              | 100                                  | --  |

-- Zero.

<sup>1</sup>Includes drilling and cutting without blasting, dredging, mechanical excavation and nonfloat washing, and other surface mining methods.

<sup>2</sup>Includes aplite.

<sup>3</sup>Excludes volcanic cinder and scoria; included with "Crushed stone."

TABLE 8  
EXPLORATION ACTIVITY IN THE UNITED STATES IN 2004, BY METHOD, COMMODITY, AND STATE<sup>1</sup>

(Meters)

| Commodity or State         | Churn<br>drilling | Diamond<br>drilling | Rotary and reverse<br>circulation drilling | Percussion and other<br>drilling, and trenching | Grand total |
|----------------------------|-------------------|---------------------|--|---|-------------|
| Commodity:                 |                   |                     |  |   |             |
| Gold                       | 263,000           | 156,000             | 578,000                                    | W   | 997,000     |
| Silver                     | --                | 1,800               | 2,500                                      | --  | 4,300       |
| Other <sup>2</sup>         | --                | 40,800              | 32,400                                     | 329,000   | 402,000     |
| Total                      | 263,000           | 198,000             | 612,000                                    | 329,000   | 1,400,000   |
| Percentage of grand total  | 19.0              | 14.0                | 44.0                                       | 23.0  | 100.00      |
| State:                     |                   |                     |  |   |             |
| Alaska                     | 2,500             | 24,100              | 35,700                                     | W   | 62,300      |
| Montana                    | --                | 1,800               | --   | W   | 1,800       |
| Nebraska                   | --                | --                  | 20,700                                     | W   | 20,700      |
| Nevada                     | 261,000           | 132,000             | 544,000                                    | W   | 937,000     |
| Undistributed <sup>3</sup> | --                | 40,800              | 11,600                                     | 329,000   | 382,000     |
| Total                      | 263,000           | 198,000             | 612,000                                    | 329,000   | 1,400,000   |

W Withheld to avoid disclosing company proprietary data; included with "Other" or "Undistributed." -- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes boron minerals, cobalt, copper, iron ore, molybdenum, soda ash, uranium, and commodities indicated by symbol W.

<sup>3</sup>Includes Arizona, California, Colorado, Idaho, North Carolina, and States indicated by symbol W.